



SNS COLLEGE OF TECHNOLOGY

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An Autonomous Institution

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DEPARTMENT CIVIL ENGINEERING

19CEB302 – CONSTRUCTION MANAGEMENT

III YEAR / V SEMESTER

Unit 3 : CONSTRUCTION SCHEDULING

Topic 4 : Crashing and Time/Cost Tradeoffs





Crashing and Time/Cost Tradeoffs



- Project **crashing** is when you shorten the duration of a project by reducing the time of one or more tasks.
- Crashing is done by increasing the resources to the project, which helps make tasks take less time than what they were planned for.
- Yes, this also adds to the cost of the overall project.
- Therefore, the primary objective of project crashing is to shorten the project while also keeping costs at a minimum.



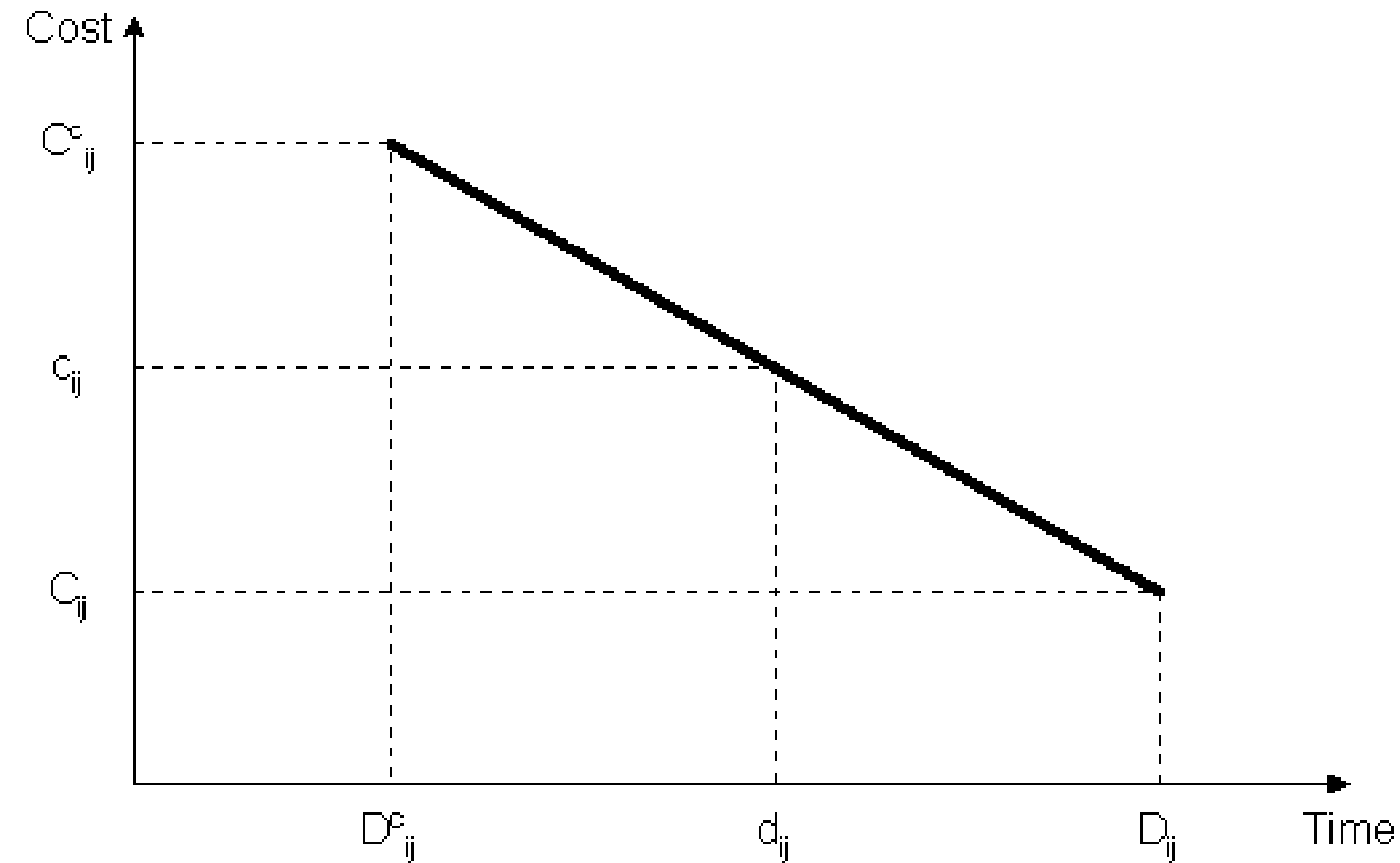
Crashing and Time/Cost Tradeoffs

- Just as the triple constraint says, if you reduce the duration of the project, or its time, then costs will in turn have to increase.
- It's a **trade off**. Crashing project management accounts for the triple constraint, in that to achieve it, you include additional resources or reduce the project requirements or scope.
- However, such drastic measures cannot be implemented without the sponsor or primary stakeholders agreeing to the changes.



Crashing and Time/Cost Tradeoffs

A simple representation of the possible relationship between the duration of an activity and its direct costs appears in Figure. This minimum completion time is commonly called the **activity crash time**. The linear relationship shown in the figure between these two points implies that any intermediate duration could also be chosen. It is possible that some intermediate point may represent the ideal or optimal trade-off between time and cost for this activity.



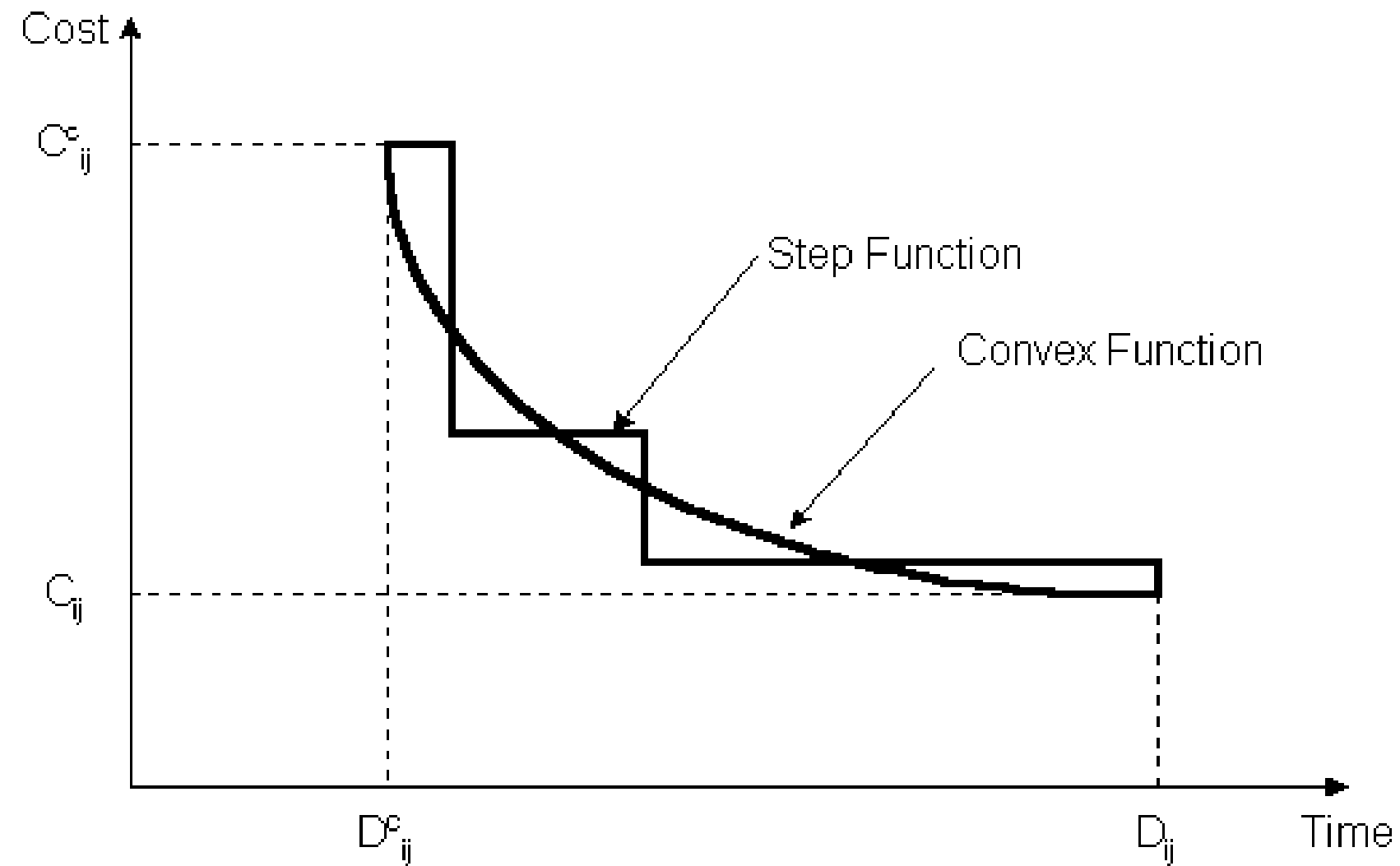


Crashing and Time/Cost Tradeoffs

Cost/time tradeoff (CTTO) is used to increase the net benefit of a project by crashing selected activities. A new aid CTTO which balances cost, time and resources is presented. Most aid methods only balance two out of the three possible parameters at a time. The new method is called **net-present-value CTTO**.



Crashing and Time/Cost Tradeoffs



What is the reason for an increase in direct cost as the activity duration is reduced?

A simple case arises in the use of overtime work. By scheduling weekend or evening work, the completion time for an activity as measured in calendar days will be reduced.

However, premium wages must be paid for such overtime work, so the cost will increase.

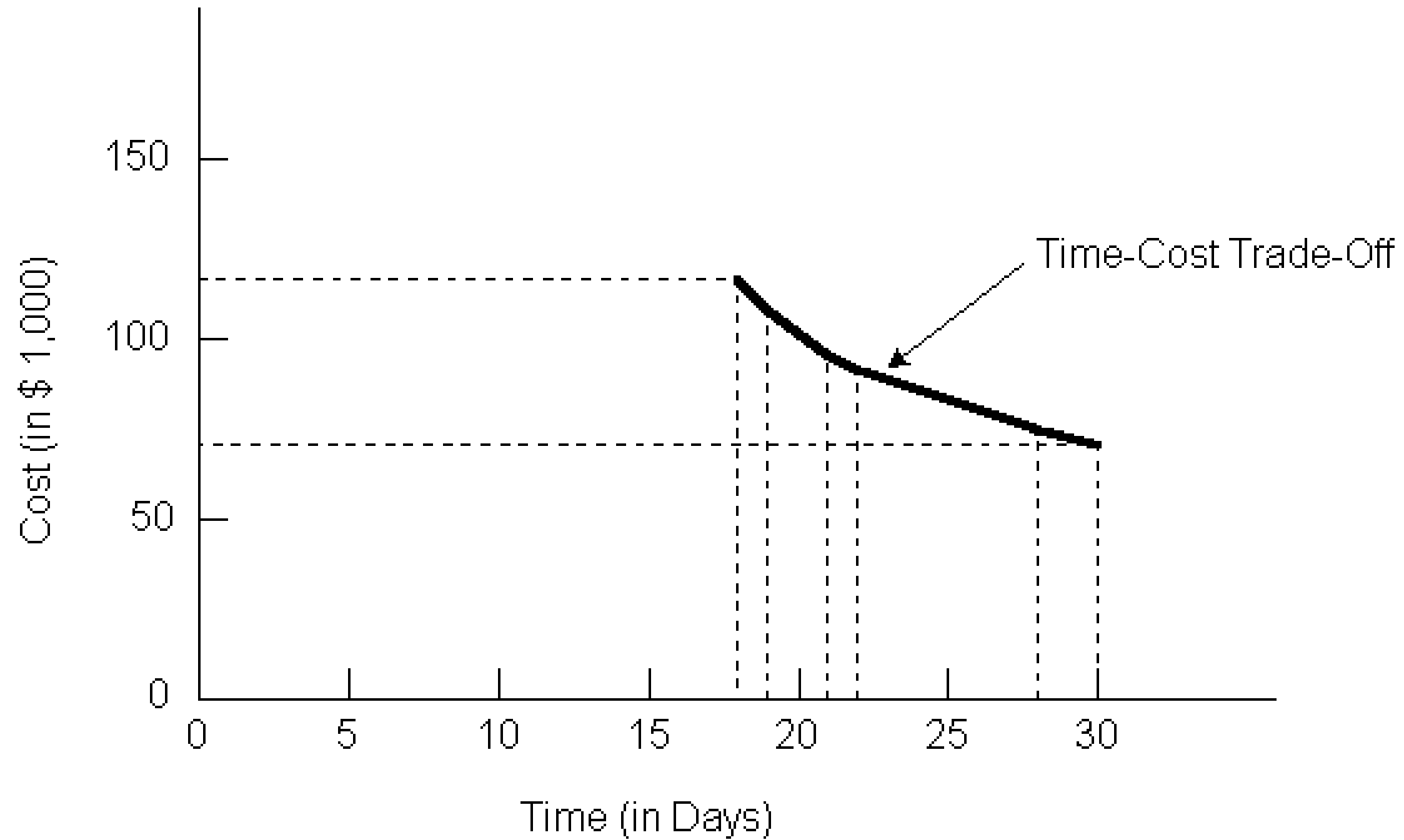


Crashing and Time/Cost Tradeoffs

Also, overtime work is more prone to accidents and quality problems that must be corrected, so indirect costs may also increase. More generally, we might not expect a *linear* relationship between duration and direct cost, but some convex functions such as the nonlinear curve or the step function shown in Figure. A linear function may be a good approximation to the actual curve, however, and results in considerable analytical simplicity



Crashing and Time/Cost Tradeoffs





Crashing and Time/Cost Tradeoffs

A result of project crashing can be a change to the [critical path](#) and the emergence of a new, different critical path. Project crash management requires that you return to your project schedule to make sure you're aware of changes that have occurred there because of the project crashing. All of this is made easier by project management software with scheduling tools. With [ProjectManager](#), you can build a project schedule in a matter of minutes on our Gantt charts, and then filter for the critical path. From there, you can make all the necessary changes you need to adjust your schedule and deliver on time and under budget. Get started for free.



Crashing and Time/Cost Tradeoffs



Project Crashing Management Stages

Once you've made the decision to use project crashing, there are some steps you'll want to follow to get the results you want.

1. Critical Path

The first thing to do is analyze the critical path of your project. This will help you determine which tasks can be shortened to bring the project to a close sooner.

Therefore, if you haven't already, calculate your critical path, see which tasks are essential and which are secondary to the project's success.



Crashing and Time/Cost Tradeoffs



2. Identify Tasks

Get a [list of all the tasks](#) you have, then meet with those who have been assigned to complete them. Ask if they believe any of the tasks they're responsible for are in the critical path and can be cut down. Then, start looking for ways to tighten up those tasks.

3. What's the Trade Off?

Once you've narrowed down the tasks in the critical path that you believe can be shortened, start calculating how much adding more resources will cost. Find the tasks that can be allocated additional resources, and come in sooner with the least amount of strain on your budget.



Crashing and Time/Cost Tradeoffs



4. Make Your Choice

When you know what you will have to spend (compared to how much time you'll save) for each of the tasks in your critical path, you must now [make a decision](#) and choose the least expensive way forward. Project crashing is not just adding resources to get done faster, but it's getting the most in return for that extra expense.

5. Create a Budget

Like any project, once you've decided on your plan, you have to pay for it. Making a project crashing budget is the next step in executing your project crashing plan. You'll have to update your baseline, schedule and [resource plan](#) to align with your new initiative.



Crashing and Time/Cost Tradeoffs



How Project Manager Makes Project Crashing Easier

Project crashing involves knowing your resources and then reallocating them. If time is working against you, then this process needs to be as efficient as possible. [ProjectManager](#) is an award-winning software that tracks your resources, teams and projects to boost productivity.



Crashing and Time/Cost Tradeoffs



Track Resource Costs

All your resources can be identified with our [resource management tools](#), from teams to supplies, equipment and more. When you add the hourly rates to the project, you can see them across all our software features. Once your team logs their hours, we calculate the actual costs for you. Then, they can be compared to the planned costs, so you know immediately if you're on target.



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Use the Gantt to Schedule Resources & Tasks

Use our MS Project - [Gantt chart](#) tool to schedule your resources. Assignments can be made while in this view. A popup window will also tell you how many hours your team member is working and if they have too many or too few tasks assigned to them. The Gantt will also filter the critical path, estimate planned costs for your resources, and set a baseline. You can even track progress on the Gantt.



Crashing and Time/Cost Tradeoffs

Balance Your Team's Workload for Efficient Project Crashing

To make sure your project crashing management plan isn't overloading some of your team while others are under-allocated, use the workload page. On the chart, you can easily see who has too many tasks, balance the workload or assign them to the project crashing.